

What Is claimed Is:

1. An IOL retainer adapted to releasably hold an IOL in an unstressed condition, said retainer adapted to be removably attached to an IOL injector while maintaining said IOL in said unstressed condition, whereby removal of the retainer from the IOL injector results in the IOL decoupling from the retainer and locating in the injector ready for delivery therethrough and into an eye.
2. The retainer of claim 1, wherein said IOL becomes located in the injector in an unstressed condition.
3. The retainer of claim 1, wherein said retainer and IOL are coupled together and sealed in a package for delivery to a surgeon.
4. The retainer of claim 3, wherein said retainer and said IOL are sterilized in said package.
5. The retainer of claim 1, and further comprising an injector body having proximal and distal ends with a lumen extending longitudinally therebetween, said injector body including an opening extending into said lumen and wherein said retainer may be removably attached.
6. The retainer of claim 1, and further comprising a stripper element located between the retainer and IOL, said stripper element operable to prevent the IOL from releasing with the retainer as the retainer is removed from the injector.
7. A retainer adapted to releasably hold an IOL having an optic and an optic periphery, said retainer having one or more support elements for releasably holding IOL, said retainer adapted to be removably attached to

an IOL injector device for transferring said IOL from said retainer to said injector.

8. The retainer of claim 7 wherein said support elements are optic support elements for releasably holding said IOL optic periphery.
9. The retainer of claim 7 wherein said IOL includes one or more haptics and said support elements are haptic support elements for releasably holding said haptics.
10. The retainer of claim 9 wherein said haptics have a predetermined curvature and said haptic support elements are cooperatively configured to the curvature of the haptics so as to constrain and maintain the curvature of the haptics during the time the IOL is attached to the retainer.
11. The retainer of claim 7 wherein said retainer is disposed of following transfer of said IOL to said injector.
12. The retainer of claim 7, wherein said retainer holds and then transfers said IOL to the injector with the IOL in a continuously unstressed condition.
13. An IOL injector device comprising:
  - a) an injector body;
  - b) a retainer adapted to releasably hold an IOL, said retainer and IOL removably connected to said injector body, whereby upon removing said retainer from said injector body, said IOL releases from said retainer and locates within said injector body.
14. The IOL injector device of claim 13 wherein said injector device including said retainer and said IOL connected thereto are sealed in a single package.

15. The injector device of claim 13 wherein said IOL is held by said retainer in an unstressed condition.
16. The injector device of claim 13 wherein said IOL locates within said injector body in an unstressed condition.
17. An IOL injector device changeable between a preloaded IOL condition, and a subsequent loaded IOL condition, said preloaded IOL condition of said injector device comprising:
  - a) an injector body having opposite proximal and distal ends and a lumen extending longitudinally therebetween;
  - b) a retainer removably attached to an opening formed in the injector body, said retainer adapted to releasably hold an IOL in a preloaded position with respect to the injector body;
  - c) a stripper finger located between the IOL and retainer; and
  - d) a plunger for advancing the IOL through the lumen and out the distal end of the injector body,whereby at time of use, the injector device is changed to the IOL loaded condition by detaching the retainer from the injector body with the stripper finger acting to prevent the IOL from releasing with the retainer, and thereby causing the IOL to locate in the lumen for subsequent engagement by the plunger.
18. The injector device of claim 17, wherein the injector device including the retainer and IOL is sealed in the same package while in said preloaded IOL condition.

19. The injector device of claim 17, and further comprising a compressor for compressing the IOL in the lumen prior to engagement by the plunger, the compressor being connected to the injector body and movable between open and closed positions with respect thereto, said closed position resulting in the IOL becoming compressed inside the lumen.
20. The injector device of claim 19 wherein the stripper finger is attached to and movable with the compressor.
21. The injector device of claim 17 wherein said stripper finger is attached to a clip adapted to be removably attached to the injector body.
22. The injector device of claim 17 wherein the stripper finger includes a through-hole comprising a viscoelastic access port.
23. The injector device of claim 17 wherein the injector body includes a through-hole comprising a viscoelastic port.
24. The injector device of claim 17, and further comprising a haptic puller having a haptic puller tip positioned in the lumen in the preloaded condition of the IOL injection device, said haptic puller tip configured to engage the leading haptic of the IOL and subsequently straighten the leading haptic within the distal tip of the injector body upon removing the haptic puller from the injector body.
25. The injector device of claim 17, wherein said plunger includes a plunger tip for engaging the IOL, and a recess formed in said plunger adjacent said plunger tip, said recess adapted to locate the trailing haptic of the IOL rearwardly of said plunger tip.

26. The injector device of claim 17, wherein said plunger includes proximal and distal shaft lengths, and further comprising one or more spring finger elements attached to said proximal shaft length and operable to apply a biasing force against the interior of the injector body lumen as said plunger is pushed through said injector body.
27. The injector device of claim 26, wherein said injector body includes proximal and distal ends, and further comprising one or more openings formed therethrough adjacent the proximal end thereof and wherein said one or more spring fingers each have a respective free end which may be removably located in a respective said opening.
28. The injector device of claim 17, wherein said plunger includes proximal and distal shaft lengths, said proximal shaft length being cooperatively configured with said lumen so as to rotationally fix said plunger with respect to said lumen.
29. The injector device of claim 28, wherein said proximal shaft length includes a leading edge and said lumen includes a radial extension, and further comprising a helical spring attached to said plunger distal shaft length and compressible between said leading edge and said radial extension as said plunger is advanced through said injector body.
30. A plunger for telescoping within a lumen defined by a lumen wall of an intraocular injector body, said plunger having a plunger shaft including at least one elongated spring finger having a first end fixed to said plunger shaft and a second, free end extending toward said plunger tip, said free end exerting a biasing force against said lumen wall.

31. The plunger of claim 30, and further comprising a second elongated spring finger having a first end fixed to said plunger shaft and a second, free end extending toward said plunger tip, said second spring finger free end applying a biasing force against said lumen wall on a side of said shaft opposite said first spring finger free end.
32. A method for loading an IOL into an internal passageway of an injector body comprising the steps of:
- a) providing a retainer adapted to releasably hold an IOL;
  - b) releasably attaching an IOL to said retainer;
  - c) removably attaching said retainer to said injector body; and
  - d) removing said retainer from said injector body, whereupon said IOL releases from said retainer and becomes located in said open passageway.
33. The method of claim 32, and further comprising the step of packaging said injector body, said retainer and said IOL together while said retainer is attached to said injector body and said IOL is releasably attached to said retainer.
34. The method of claim 32, and further comprising the step of providing a stripper element located between said IOL and said retainer, said stripper element operable to prevent said IOL from remaining with said retainer as said retainer is removed from said injector body.
35. The method of claim 32, and further comprising the steps of:
- e) providing a compressor and compressing said IOL in said open passageway; and

- f) providing a plunger having a plunger tip in said open passage and advancing said plunger therethrough, thereby pushing said IOL with said plunger tip to eject said IOL from said injector body.
- 36. The method of claim 35 and further comprising the step of applying a viscoelastic to one or both of said IOL and said open passageway prior to said compression step.
- 37. The method of claim 32, and further comprising the steps of:
  - e) providing a plunger having a plunger tip in said open passageway for advancing said IOL through said open passageway;
  - f) providing an IOL having an optic and a trailing haptic extending from said optic; and
  - g) relatively positioning said retainer with said IOL releasably held thereby and said plunger in said open passageway such that upon removal of said retainer and release of said IOL therefrom into said open passageway, said trailing haptic becomes located rearwardly of said plunger tip such that upon advancing said plunger through said open passageway, said plunger tip engages said IOL optic without contacting said trailing haptic.
- 38. The method of claim 32, and further comprising the steps of:
  - e) providing an IOL with an optic and a leading haptic extending from said optic;
  - f) providing a haptic puller having a haptic puller tip removably inserted into said open passageway and adapted to engage and

straighten said leading haptic within said distal end upon removing said haptic puller from said injector body; and

- g) relatively positioning said retainer with said IOL releasably held thereby and said haptic puller in said open passageway such that upon removal of said retainer and release of said IOL therefrom into said open passageway, said leading haptic becomes located adjacent said haptic puller tip.

39. The method of claim 32, and further comprising the steps of:

- e) providing an IOL having leading and trailing haptics extending from said optic;
- f) providing a plunger having a plunger tip in said open passageway for advancing said IOL through said open passageway;
- g) providing a haptic puller having a haptic puller tip removably inserted into said open passageway and adapted to engage and pull said at least one haptic out of said distal end upon removing said haptic puller from said injector body; and
- h) relatively positioning said retainer with said IOL releasably held thereby, said plunger, and said haptic puller in said open passageway such that upon removal of said retainer and release of said IOL therefrom into said open passageway, said trailing haptic becomes located on the side of said plunger tip opposite said optic, and said leading haptic becomes located adjacent said haptic puller tip.



40. The method of claim 32, and further comprising the steps of:
- e) providing a stripper element located between said IOL and said retainer, said stripper element acting to prevent said IOL from lifting with said retainer upon removing said retainer from said injector body; and
  - f) providing a compressor movable between an open position and a closed position with respect to said injector body, said compressor being in said open position when said retainer is attached to said injector body and said IOL is held by said retainer; and
  - g) following the step of removing said retainer from said injector body, moving said compressor to said closed position and thereby compressing said IOL in said open passageway.
41. The method of claim 40, wherein said compressor and said stripper element are connected and move together whereby the step of moving said compressor to said closed position causes said stripper element to move away said injector body.
42. A method for packaging an IOL and injector together comprising the steps of:
- a) providing an IOL having an optic;
  - b) providing an IOL retainer adapted to releasably hold said IOL and releasably attaching said IOL to said retainer;
  - c) providing an injector body having an IOL delivery passageway and removably attaching said retainer and said IOL to said injector

- body with said IOL in communication with said delivery passageway;
- d) providing a compressor for compressing the IOL in the injector body;
  - e) providing a stripper element and locating said stripper element between said IOL and said retainer; and
  - f) providing a package and placing said injector body with said retainer, said IOL, said compressor and said stripper element in a package for delivery to a surgeon.
43. The method of claim 42 and further comprising the step of sterilizing said package prior to delivery to said surgeon.
44. A compressor drawer for compressing an IOL in an injector device, the injector device being operable to deliver an IOL into an eye, said compressor drawer attached to said injector device and movable between a fully open position, a partly closed position and a fully closed position with respect to said injector body, said IOL being compressed when said compressor drawer is moved to said fully closed position, said compressor drawer including a spring arm having an edge configured to abut a feature of said injector device when said compressor drawer is in said partly closed position to prevent further closing of said compressor drawer until said edge is released from said feature of said injector device.
45. The compressor drawer of claim 44 wherein said spring arm extends between a pair of side rails which slide within respective drawer slides extending from said injector device.

46. The compressor drawer of claim 45 and further comprising an optic stripper element.
47. The compressor drawer of claim 45 and further comprising at least one haptic stripper element.
48. The compressor drawer of claim 45 and further comprising an optic stripper element and at least one haptic stripper element.
49. The compressor drawer of claim 46 and further comprising a finger press located opposite said optic stripper element, said finger press for manually moving said compressor drawer from said fully open position to said partly closed position and subsequently to said fully closed position with respect to said injector device.
50. The compressor drawer of claim 48 wherein first and second haptic stripper elements extend on either side of said optic stripper element.
51. The compressor drawer of claim 44 and further comprising:
- a) a lumen extending longitudinally through said injector body;
  - b) an opening providing access to the lumen of said injector body;
  - c) a retainer for releasably holding said IOL, said retainer adapted to be removably attached to the opening of said injector device;
  - d) an optic stripper element attached to said compressor drawer,
- wherein said optic stripper element becomes located between said retainer and IOL when said compressor is moved from said fully open position to said partly closed position.
52. The compressor drawer of claim 51 and further comprising a vertical flange attached to said compressor drawer, said flange abutting said

- retainer when said compressor is moved to said partly closed position and thereby preventing said compressor from moving to said fully closed position until said retainer is removed from said injector device.
53. The compressor drawer of claim 52 wherein upon removal of said retainer from said injector device, said IOL becomes located in said lumen of said injector device and is prevented from releasing with said retainer due to said optic stripper finger.
54. The compressor drawer of claim 53 wherein said optic stripper element includes at least one through hole configured to engage the periphery of said IOL during removal of said retainer from said injector body.
55. The compressor drawer of claim 44 and further comprising a finger grasp flange attached to said injector body opposite said compressor drawer to assist in manually handling said device.
56. The retainer of claim 1, said retainer including first and second attachment legs configured for removably attaching said retainer to said IOL injector.
57. The retainer of claim 56 and further comprising first and second flanges located adjacent said first and second legs, said first and second flanges abutting apportion of said IOL injector to stabilize the retainer on the IOL injector.
58. The retainer of claim 57 wherein said flanges each include a corner acting as a pivot point allowing said retainer to be pivoted off of said IOL injector.

- 59. The retainer of claim 56 wherein said first and second attachment legs each include a catch configured for snap fitting said retainer to said injector.
- 60. The retainer of claim 56 wherein said retainer includes at least one optic support element for releasably supporting the optic of an IOL.
- 61. The retainer of claim 56 wherein said retainer includes at least one haptic support element for releasably supporting at least one haptic of an IOL.
- 62. The retainer of claim 56 wherein said retainer includes at least one optic support element and a least one haptic support element for releasably supporting the optic and haptic of an IOL, respectively.
- 63. The retainer of claim 62 wherein said haptic support elements are configured to constrain their respective haptics at the desired lens diameter.
- 64. The retainer of claim 62 and further comprising a slot wherethrough a respective haptic may be positioned, said slot being defined by a slot wall which acts to substantially inhibit translation or rotation of said IOL while attached to said retainer.
- 65. The retainer of claim 64 wherein said slot is formed adjacent said optic support element.
- 66. The retainer of claim 1 and further comprising a cover for removably attaching to said retainer to protect an IOL attached to said retainer.
- 67. The retainer of claim 66 wherein said cover includes an enclosure defined by a top wall and side walls which enclose said IOL when said retainer and said cover are coupled together.

- 68. The retainer of claim 67 wherein the interior of said top wall includes at least one feature for providing auxiliary support to said IOL.
- 69. The retainer of claim 68 wherein at least one feature comprises a projection for supporting the periphery of the IOL optic.
- 70. The retainer of claim 68 wherein said at least one feature comprises a projection for supporting said at least one haptic.
- 71. The retainer of claim 66 wherein said cover includes first and second slots wherethrough said first and second legs of said retainer are located when said cover is attached to said retainer.
- 72. The retainer of claim 66 wherein said cover includes a finger grasp flange for manually handling said cover with respect to said retainer.
- 73. The device of claim 25 wherein said recess is a first recess and further comprising a second recess in said plunger tip located opposite said first recess, said second recess allowing said trailing haptic to locate therein should the trailing haptic fail to locate in said first recess.